MITSUBISHI MOTORS Workshop Manual

chassis SUPPLEMENT

3000GT '99

Pub. No. PWUE9119-H
Pub. No. PWUE9203-8
FOREWORD

This Workshop Manual contains procedures for removal, disassembly, inspection, adjustment, reassembly and installation, etc. for service mechanics. Use the manuals indicated on the following page in combination with this manual as required.

All information, illustrations and product descriptions contained in this manual are current as at the time of publication. We, however, reserve the right to make changes at any time without prior notice or obligation.
RELATED PUBLICATIONS

TECHNICAL INFORMATION MANUAL
PYUE9201

WORKSHOP MANUAL
Chassis Group
PWUE9119 (Loose-leaf edition)
PWUE9119-E (Supplement)
PWUE9119-F (Supplement)
PWUE9119-G (Supplement)
PWUE9119 (Loose-leaf edition)
PWUE9203 (Basic)
PWUE9203-1 (Supplement)
PWUE9203-2 (Supplement)
PWUE9203-3 (Supplement)
PWUE9203-4 (Supplement)
PWUE9203-5 (Supplement)
PWUE9203 (Loose-leaf edition)

<General Export, GCC and Australia>

Engine Group
ELECTRICAL WIRING
PWUE9201 (Loose-leaf edition)
PWUE9201-D (Supplement)
PWUE9201-E (Supplement)
PWUE9201-F (Supplement)
PWUE9201-G (Supplement)
PWUE9406 (Basic)
PWUE9406-1 (Supplement)
PWUE9406-2 (Supplement)
PWUE9406-3 (Supplement)

<General Export, GCC and Australia>

PARTS CATALOGUE
B608K408A
B808K408A

WARNINGS REGARDING OF SUPPLEMENTAL RESTRAINT SYSTEM (SRS) EQUIPPED VEHICLES

WARNING!
(1) Improper service or maintenance of any component of the SRS, or any SRS-related component, can lead to personal injury or death to service personnel (from inadvertent firing of the air bag) or to the driver (from rendering the SRS inoperative).
(2) If it is possible that the SRS components are subjected to heat over 93°C (200°F) in baking or in drying after painting, remove the SRS components (air bag module, SRS-ECU) beforehand.
(3) Service or maintenance of any SRS component or SRS-related component must be performed only at an authorized MITSUBISHI dealer.
(4) MITSUBISHI dealer personnel must thoroughly review this manual, and especially its GROUP 52B – Supplemental Restraint System (SRS), before beginning any service or maintenance of any component of the SRS or any SRS-related component.
**VEHICLE IDENTIFICATION**

**MODEL**

**VEHICLES FOR EUROPE**

<table>
<thead>
<tr>
<th>Model code</th>
<th>Engine model</th>
<th>Transmission model</th>
<th>Fuel supply system</th>
</tr>
</thead>
<tbody>
<tr>
<td>Z16AMJGFL6</td>
<td>6G72 (2,972 mℓ)</td>
<td>W6MG1</td>
<td>MPI</td>
</tr>
<tr>
<td>Z16AMJGFR6</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**VEHICLES FOR GENERAL EXPORT**

<table>
<thead>
<tr>
<th>Model code</th>
<th>Engine model</th>
<th>Transmission model</th>
<th>Fuel supply system</th>
</tr>
</thead>
<tbody>
<tr>
<td>Z16AMNGFL</td>
<td>6G72 (2,972 mℓ)</td>
<td>W5MG1</td>
<td>MPI</td>
</tr>
<tr>
<td>Z16AMNGFR</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**VEHICLES FOR GCC**

<table>
<thead>
<tr>
<th>Model code</th>
<th>Engine model</th>
<th>Transmission model</th>
<th>Fuel supply system</th>
</tr>
</thead>
<tbody>
<tr>
<td>Z16AMNGFLW</td>
<td>6G72 (2,972 mℓ)</td>
<td>W5MG1</td>
<td>MPI</td>
</tr>
</tbody>
</table>

**CHASSIS NUMBER**

The chassis number is stamped on the toeboard inside the engine compartment.
1. Asia
2. Japan
3. MITSUBISHI
   A - For Europe, right hand drive
   B - For Europe, left hand drive
   Y - For General Export or GCC
4. Body style
   M - 2-door hatchback
5. Transmission type
   N - 5-speed manual transmission
   J - 6-speed manual transmission
6. Development order
   Z16 - 2,972 mℓ (Full time 4WD)
7. Sort
   A - Passenger car
8. Model year
   X - 1999
9. Plant
   Y - Ohe Motor Vehicle Works
10. Serial number
    A J M B M N Z16 A X Y 000001
FUEL

CONTENTS

GENERAL ................................................. 2
   Outline of Changes .................................. 2

SPECIFICATIONS ............................................ 2
   General Specifications ................................ 2

TROUBLESHOOTING ........................................... 2

ON-VEHICLE INSPECTION OF MPI
COMPONENTS ............................................ 3
   Power Supply and Ignition Switch-IG .............. 3
   Engine Control Unit Power Earth .................. 4
   Fuel Pump ............................................ 5
   Air Flow Sensor ..................................... 8
   Intake Air Temperature Sensor ..................... 10
   Barometric Pressure Sensor ......................... 11
   Engine Coolant Temperature Sensor ............... 13
   Throttle Position Sensor ........................... 14
   Idle Position Switch ................................ 16
   Cam Position Sensor ................................ 17
   Crank Angle Sensor ................................ 19

   Ignition Switch-ST .................................. 21
   Vehicle Speed Sensor ................................ 22
   Power Steering Fluid Pressure Switch ............ 24
   Air Conditioner Switch and Power Relay .......... 25
   Detonation Sensor ................................... 26
   Electrical Load Switch .............................. 27
   Oxygen Sensor ....................................... 28
   Fan Motor Relay (Radiator Fan, Condenser Fan) .. 30
   Injectors .............................................. 32
   Idle Speed Control Servo (Stepper Motor Type) .. 33
   Ignition Coil and Power Transistor ................. 34
   Purge Control Solenoid Valve ....................... 37
   EGR Control Solenoid Valve ......................... 38
   Fuel Pressure Control Valve ......................... 39
   Waste Gate Control Solenoid Valve .................. 40
   Boost Meter ......................................... 41
   Anti-lock Braking Signal ............................ 42
   Terminal Voltage Check Chart ..................... 42

HARNESS INSPECTION

1. Measure the ignition switch (IG) terminal input voltage.
   - Engine start (engine cranking)
   - Disconnected
   *
   Engine control unit harness side connection
   OFF .............. 0~1 V
   ON .................. 5 V

2. Repair the harness (ignition switch - IG) or check the ignition switch.
GENERAL

OUTLINE OF CHANGES

- The engine-ECU in the vehicle for Europe has been changed as follows. Service procedures for areas which are different from before have been established to correspond to this.

  (1) The engine-ECU connector terminal layout has been changed to correspond to changes in the inhibitor system.

SPECIFICATIONS

GENERAL SPECIFICATIONS

<table>
<thead>
<tr>
<th>Items</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engine control unit identification model No.</td>
<td></td>
</tr>
<tr>
<td>LHD</td>
<td>E2T61492</td>
</tr>
<tr>
<td>RHD</td>
<td>E2T61491</td>
</tr>
</tbody>
</table>

TROUBLESHOOTING

NOTE

Replace the engine-ECU together with the immobilizer-ECU and ignition key.
ON-VEHICLE INSPECTION OF MPI COMPONENTS

POWER SUPPLY AND IGNITION SWITCH-IG

HARNESS INSPECTION

Measure the ignition switch (IG) terminal input voltage.

- Engine control unit connector: Disconnected

<table>
<thead>
<tr>
<th>Ignition switch</th>
<th>Voltage (V)</th>
</tr>
</thead>
<tbody>
<tr>
<td>OFF</td>
<td>0 – 1</td>
</tr>
<tr>
<td>ON</td>
<td>SV</td>
</tr>
</tbody>
</table>

Repair the harness.
(Ignition switch – Ig) or check the ignition switch
FUEL – On-vehicle Inspection of MPI Components

2
Harness side connector

Measure the power supply voltage of the control relay.
- Ignition switch: OFF
- Control relay connector: Disconnected

| Voltage (V) | SV |

3
Harness side connector

Check for an open-circuit, or a short-circuit to earth, between the engine control unit and the control relay.
- Engine control unit connector: Disconnected
- Control relay connector: Disconnected

4
Harness side connector

Measure power voltage to the actuator.
- Control relay connector: Connected
- Engine control unit connector: Connected

<table>
<thead>
<tr>
<th>Engine</th>
<th>Voltage (V)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cranking</td>
<td>8V or higher</td>
</tr>
<tr>
<td>Racing</td>
<td>SV</td>
</tr>
</tbody>
</table>

ENGINE CONTROL UNIT POWER EARTH

Engine control unit

Engine control unit connector
HARNESS INSPECTION

1. Check the fuel pump.
   - Apply battery voltage to the fuel pump relay No. 2 and operate the pump.

2. Check the earth circuit of the fuel pump.
   - Fuel pump connector: Disconnected

3. Check for an open-circuit, or a short-circuit to earth, between the fuel pump relay No. 2 and the fuel pump.
   - Fuel pump relay No. 2 connector: Disconnected
   - Fuel pump connector: Disconnected

4. Check for an open-circuit, or a short-circuit to earth, between the fuel pump relay No. 2 and the engine control unit.
   - Fuel pump relay No. 2 connector: Disconnected
   - Engine control unit connector: Disconnected

5. Check for continuity between the fuel pump relay No. 2 and the resistor (for fuel pump).
   - Fuel pump relay No. 2 connector: Disconnected
   - Resistor (for fuel pump) connector: Disconnected

6. Repair the harness.
   - Fuel pump harness (B 11 - D 11)
Check for continuity between the resistor (for fuel pump) and fuel pump:
- Resistor (for fuel pump) connector: Disconnected
- Fuel pump connector: Disconnected

Repair the harness.

Measure the power supply voltage of the fuel pump relay No.1.
- Fuel pump relay No.1 connector: Disconnected

Repair the harness.

Check for an open-circuit, or a short-circuit to earth between the fuel pump relay No.1 and the engine control unit.
- Control relay connector: Disconnected
- Engine control unit connector: Disconnected

Repair the harness.

Check for continuity between the control relay No.1 and the control relay No.2.
- Control relay No.1 connector: Disconnected
- Control relay No.2 connector: Disconnected

Repair the harness.
AIR FLOW SENSOR

Air flow sensor (with built-in intake air temperature sensor and barometric pressure sensor)

Equipment side connector

Harness side connector

Output frequency (Hz)

Air flow rate (liters/second)

Engine control unit connector

Check for continuity between the fuel pump relay No.2 and the resistor (for fuel pump).

Fuel pump relay No.2: Disconnected

Resistor (for fuel pump) connector: Disconnected

Repair the harness.
# Harness Inspection

## 1. Measure the Power Supply Voltage
- **Connector**: Disconnected
- **Ignition Switch**: ON

<table>
<thead>
<tr>
<th>Voltage (V)</th>
<th>SV</th>
</tr>
</thead>
<tbody>
<tr>
<td>OK</td>
<td></td>
</tr>
</tbody>
</table>

**Action**: Repair the harness

(7FU0655)

## 2. Measure the Terminal Voltage
- **Connector**: Disconnected
- **Ignition Switch**: ON

<table>
<thead>
<tr>
<th>Voltage (V)</th>
<th>4.8 - 5.2</th>
</tr>
</thead>
<tbody>
<tr>
<td>OK</td>
<td></td>
</tr>
</tbody>
</table>

**Action**: Repair the harness

(7FU0656)

## 3. Check for Continuity of the Earth Circuit
- **Connector**: Disconnected

**Action**: Repair the harness

(7FU0657)

## 4. Check for Continuity between the Air Flow Sensor and the Engine Control Unit
- **Air Flow Sensor Connector**: Disconnected
- **Engine Control Unit Connector**: Disconnected

**Action**: Repair the harness

(7FU0745)
INTAKE AIR TEMPERATURE SENSOR

Air flow sensor (with built-in intake air temperature sensor and barometric pressure sensor)

Resistence vs. Temperature

Output voltage vs. Temperature

Equipment side connector

Air flow sensor connector

Harness side connector

HARNESS INSPECTION

Check for continuity of the earth circuit.
- Connector: Disconnected

Repair the harness.

(A) 5V 92
Measure the power supply voltage.

- Connector: Disconnected
- Ignition switch: ON

| Voltage (V) | 4.5 - 4.9 |

Repair the harness.

BAROMETRIC PRESSURE SENSOR

Air flow sensor (with built-in intake air temperature sensor and barometric pressure sensor)

Barometric pressure sensor

Barometric pressure sensor connector

Harness side connector

Equipment side connector

Output voltage (V)

<table>
<thead>
<tr>
<th>Voltage (V)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 4</td>
</tr>
</tbody>
</table>

Barometric pressure (mmHg [in. Hg])

<table>
<thead>
<tr>
<th>Barometric pressure (mmHg [in. Hg])</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 8</td>
</tr>
</tbody>
</table>

Engine control unit connector

Engine control unit connector

Repair the harness.
##Harness Inspection

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
<th>Diagram</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Check for continuity of the earth circuit.</td>
<td><img src="7FU0657" alt="Diagram" /></td>
</tr>
<tr>
<td></td>
<td>- Connector: Disconnected</td>
<td></td>
</tr>
<tr>
<td></td>
<td><img src="image" alt="OK" /> → 2 → Repair the harness.</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Measure the power supply voltage of the barometric pressure sensor.</td>
<td><img src="7FU0665" alt="Diagram" /></td>
</tr>
<tr>
<td></td>
<td>- Connector: Disconnected</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Ignition switch: ON</td>
<td></td>
</tr>
<tr>
<td></td>
<td><img src="image" alt="OK" /> → 3 → Repair the harness.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Voltage (V)</td>
<td></td>
</tr>
<tr>
<td></td>
<td><img src="image" alt="OK" /> → 3 → Repair the harness.</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Check for an open-circuit, or a short-circuit to earth between the engine control unit and the barometric pressure sensor.</td>
<td><img src="7FU0666" alt="Diagram" /></td>
</tr>
<tr>
<td></td>
<td>- Air flow sensor connector: Disconnected</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Engine control unit connector: Disconnected</td>
<td></td>
</tr>
<tr>
<td></td>
<td><img src="image" alt="OK" /> → STOP → Repair the harness.</td>
<td></td>
</tr>
</tbody>
</table>
ENGINE COOLANT TEMPERATURE SENSOR

HARNESS INSPECTION

1. Check for continuity of the earth circuit.
   - Connector: Disconnected

   OK → 2
   Repair the harness.
   (A) 2 → 92
**FUEL - On-vehicle Inspection of MPI Components**

### Step 2

**Harness side connector**

- **Measure the power supply voltage.**
  - Connector: Disconnected
  - Ignition switch: ON
  - Voltage (V):
    - **OK**
      - | Voltage (V) |
      - | 4.5 - 4.9 |
      - **STOP**
    - **OK**
      - Repair the harness.
      - (1 - 83)

---

**THROTTLE POSITION SENSOR**

---

**Equipment side connector**

- **Engine control unit connector**
  - | Terminal voltage (V) |
  - | Minimum | Maximum |
  - | 5 V |

**Engine control unit connector**
**HARNESS INSPECTION**

1. **Harness side connector**
   - Measure the power supply voltage of the throttle position sensor:
     - Connector: Disconnected
     - Ignition switch: ON
   - Voltage (V)
     - 4.8 - 5.2
   - OK → 2
     - Repair the harness.
     - (A) 1 - 81

2. **Harness side connector**
   - Check for continuity of the earth circuit
     - Connector: Disconnected
   - OK → 3
     - Repair the harness.
     - (A) 4 - 92

3. **Harness side connector**
   - Check for an open circuit, or a short-circuit to earth between the engine control unit and the throttle position sensor:
     - Throttle position sensor connector: Disconnected
     - Engine control unit connector: Disconnected
   - OK → STOP
     - Repair the harness.
     - (A) 2 - 84
IDLE POSITION SWITCH

Throttle position sensor (Idle position switch mounted)

Engine control unit connector

HARNESS INSPECTION

Measure the power supply voltage of the idle position switch.
- Connector: Disconnected
- Ignition switch: ON

Voltage (V)

4 or more

Repair the harness. (A 3 - 87)

Check for continuity of the earth circuit.
- Connector: Disconnected

Repair the harness. (A 4 - 92)
CAM POSITION SENSOR

Cam position sensor

Control relay

Equipment side connector

Cam position sensor connector

Output characteristic

Terminal voltage (V)

Time

Engine control unit connector

Engine control unit

5V

7FU0677

9FU0393
## Harness Inspection

### 1

**A** Harness side connector

- **Control relay harness side connector**

**OK** → **2**

Check for continuity between the cam position sensor and control relay:
- Cam position sensor connector: Disconnected
- Control relay connector: Disconnected

**NOTE**

- Touch ohmmeter probes to both ends of the harness.

### 2

**A** Harness side connector

- **Cam position sensor connector**: Disconnected

**OK** → **3**

Check for continuity of the earth circuit.
- Cam position sensor connector: Disconnected

**OK** → **4**

- Engine control unit harness side connector: Connected
- Engine control unit connector: Disconnected
- Cam position sensor connector: Disconnected

**OK** → **STOP**

**OK** → **Replace the engine control unit.**

- Cam position sensor connector: Disconnected
- Engine control unit connector: Connected
- Ignition switch: ON

| Voltage (V) | 4.8 – 5.2 |

**OK** → **STOP**

**OK** → **Replace the harness.**

**OK** → **Replace the harness.**

**OK** → **Replace the harness.**

**OK** → **Replace the harness.**
CRANK ANGLE SENSOR

- Control relay
- Equipment side connector
- Harness side connector
- Engine control unit
- Output characteristic
- Engine control unit connector
1. **Harness Inspection**

   - Check for continuity between the crank angle sensor and the control relay.
     - Crank angle sensor connector: Disconnected
     - Control relay connector: Disconnected
   - NOTE: Touch ohmmeter probes to both ends of the harness.
     - Repair the harness.

2. **Check for continuity of the earth circuit.**

   - Crank angle sensor connector: Disconnected
   - Repair the harness.

3. **Check for an open-circuit, or a short-circuit to earth between the crank angle sensor and the engine control unit.**

   - Engine control unit connector: Disconnected
   - Crank angle sensor connector: Disconnected
   - Repair the harness.

4. **Measure the impressed voltage.**

   - Crank angle sensor connector: Disconnected
   - Engine control unit connector: Connected
   - Ignition switch: ON
   - Voltage (V):
     - 4.8–5.2
   - Replace the engine control unit.
IGNITION SWITCH-ST

Engine control unit connector

HARNESS INSPECTION

1. Measure the input voltage to the engine control unit.
   - Engine control unit connector: Disconnected
   - Ignition switch: START

   Voltage (V)
   - 8 or more

   OK

   Repair the harness.
   (71 - Ignition switch)

2. Check for continuity of the earth circuit.
   - Engine control unit connector: Disconnected

   OK

   Repair the harness.
   (91 - Earth)
VEHICLE SPEED SENSOR

Vehicle speed sensor

Terminal voltage (V)

5 0 1
16Z478

Vehicle speed [km/h (mph)]
16Z451

Frequency [Hz]

HARNESS INSPECTION

1

A Harness side connector

Measure the line voltage of the vehicle speed sensor.
- Connector: Disconnected
- Ignition switch: ON

Voltage (V)
B+ 1FU0969

OK

2

Repair the harness. (\\@T-Ignition switch)
Check the vehicle speed sensor output circuit for continuity.
- Engine control unit connector: Disconnected
- Ignition switch: ON
- Move the vehicle

<table>
<thead>
<tr>
<th>Continuity</th>
</tr>
</thead>
<tbody>
<tr>
<td>OK</td>
</tr>
</tbody>
</table>

Measure the power supply voltage of the vehicle speed sensor.
- Connector: Disconnected
- Ignition switch: ON

<table>
<thead>
<tr>
<th>Voltage (V)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.5 - 4.9</td>
</tr>
</tbody>
</table>

Check for continuity of the ground circuit.
- Connector: Disconnected

<table>
<thead>
<tr>
<th>Ground</th>
</tr>
</thead>
<tbody>
<tr>
<td>Repair the harness. (A 3 - 66)</td>
</tr>
</tbody>
</table>

- Air conditioner switch: ON
- Engine control unit connector
- Ignition switch: ON
- Ignition switch: OFF
POWERS STEERING FLUID PRESSURE SWITCH

Measure the Power supply voltage.
- Connector: Disconnected
- Ignition switch: ON

<table>
<thead>
<tr>
<th>Engine control unit connector</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>ON</th>
<th>OFF</th>
</tr>
</thead>
<tbody>
<tr>
<td>700-2,000 (70-200)</td>
<td>1,500-2,000 (150-200)</td>
</tr>
<tr>
<td>100-284 (1-28)</td>
<td>213-284 (21-28)</td>
</tr>
</tbody>
</table>

Pressure [kPa (kg/cm², psi)]

Repair the harness.

(1) Harness side connector

HARNESS INSPECTION

7FU0505

9FU0393
AIR CONDITIONER SWITCH AND POWER RELAY

Air conditioner compressor relay
Air conditioner control unit
Air conditioner compressor lock controller
Dual pressure switch
Engine control unit
Engine control unit connector
Battery

HARNESS INSPECTION

Measure the power supply voltage of the air conditioner circuit:

- Air conditioner switch: ON
- Engine control unit connector: Disconnected
- Ignition switch: ON

<table>
<thead>
<tr>
<th>Voltage (V)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SV</td>
</tr>
</tbody>
</table>

Check the air conditioner circuit.
DETONATION SENSOR

Engine control unit connector

A Equipment side connector

9 FU0393

HARNESS INSPECTION

Check for an open-circuit or a short-circuit to earth, between the engine control unit and detonation sensor.

- Detonation sensor connector: Disconnected
- Engine control unit connector: Disconnected

Repair the harness.

(A 1 - 78)
Check for continuity of the earth circuit.
- Connector: Disconnected

OK → STOP

Repair the harness.
(A2 – Earth)

ELECTRICAL LOAD SWITCH

Engine control unit connector

HARNESS INSPECTION

Measure the input voltage of engine control unit.
- Engine control unit connector: Disconnected
- Lighting switch: ON (Tail lamp relay ON)

Voltage (V)
SV

OK

Check circuit related to tail lamp relay
FUEL - On-vehicle Inspection of MPI Components

2

Measure the input voltage of engine control unit.
- Engine control unit connector: Disconnected
- Defogger switch: ON (Defogger relay ON)

OK → 3

Check circuit related to defogger relay

OK

3

Measure the input voltage of engine control unit.
- Engine control unit connector: Disconnected
- Brake pedal: Depressed (Stop lamp switch ON)

OK

Check circuit related to stop lamp relay

OXYGEN SENSOR

Engine control unit harness side connector

Engine control unit harness side connector

Oxygen sensor (Right bank)

Oxygen sensor (Left bank)

Check circuit related to defogger relay

Check circuit related to stop lamp relay

Electro motive force [V]

Theoretical A/F

Rich

Lean

14

15

16

A/F

ECI007

Engine control unit connector

9FU0393
HARNESS INSPECTION

1. Harness side connector

Control relay harness side connector

Check for continuity between the oxygen sensor and the control relay.
- Control relay connector: Disconnected
- Oxygen sensor connector: Disconnected

NOTE
Touch the ohmmeter probes to both ends of the harness.

2. Harness side connector

Engine control unit harness side connector

Check for an open-circuit, or a short-circuit to earth, between the engine control unit and the oxygen sensor.
- Oxygen sensor connector: Disconnected
- Engine control unit connector: Disconnected

3. Harness side connector

Check for continuity of the earth circuit.
- Connector: Disconnected

STOP
Repair the harness.

(A) [C] 1
(B) [C] 1
FAN MOTOR RELAY (RADIATOR FAN, CONDENSER FAN) <From 1995 models>

- Radiator fan motor relay (Hi)
- Radiator fan motor relay (Lo)
- Condenser fan motor relay (Hi)
- Condenser fan motor relay (Lo)

Connections:
- Ignition switch (IG)
- Battery
- Radiator fan motor
- Resistor
- Engine control unit
- Air conditioner compressor control
- To air conditioner compressor

Diagram:
- Engine control unit connector
- Diagram components labeled with numbers and symbols for connections.
HARNESS INSPECTION

Measure input voltage applied to engine control unit
- Engine control unit connector: Disconnected
- Ignition switch: ON

<table>
<thead>
<tr>
<th>Voltage (V)</th>
</tr>
</thead>
<tbody>
<tr>
<td>B+</td>
</tr>
</tbody>
</table>

OK → STOP

Check the fan motor relay circuit
**HARNESS INSPECTION**

1. **Harness side connector**
   - **Connector:** Disconnected
   - **Ignition switch:** ON
   - **Measure the power supply voltage of the ignition coil:**
     - **Voltage (V):** SV
     - **Repair the harness:** (A) - Ignition switch

2. **Harness side connector**
   - **Connector:** Disconnected
   - **Ignition switch:** ON
   - **Measure the power supply voltage of the ignition coil:**
     - **Voltage (V):** SV
     - **Repair the harness:** (B) - Ignition switch

3. **Harness side connector**
   - **Check for an open-circuit, or a short-circuit to earth between the engine control unit and the power transistor:**
     - **Engine control unit connector:** Disconnected
     - **Power transistor connector:** Disconnected
     - **OK**
     - **Repair the harness:** (B 15 - 58)

4. **Harness side connector**
   - **Check for an open-circuit, or a short-circuit to earth between the power transistor and the ignition coil:**
     - **Ignition coil connector:** Disconnected
     - **Power transistor connector:** Disconnected
     - **OK**
     - **Repair the harness:** (2 3 / 1 2 / 4 1)

---

**Notes:**
- Always check the harness connections before proceeding with any repair work.
- Use a multimeter to measure voltage and check for open-circuit or short-circuit conditions.
- Ensure all components are securely connected to avoid electrical problems.
5

Check for continuity of the earth circuit
- Connector: Disconnected

![Diagram of fuel system](image)

6

Measure the voltage of the control signal circuit of the power transistor
- Connector: Disconnected
- Ignition switch: START

<table>
<thead>
<tr>
<th>Voltage (V)</th>
<th>OK</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5 - 4.0</td>
<td></td>
</tr>
</tbody>
</table>

![Diagram of fuel system](image)

7

Measure the voltage of the ignition timing adjustment terminal
- Ignition switch: ON

<table>
<thead>
<tr>
<th>Voltage (V)</th>
<th>OK</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.0 - 5.2</td>
<td></td>
</tr>
</tbody>
</table>

![Diagram of fuel system](image)
PURGE CONTROL SOLENOID VALVE

Check for continuity between purge control solenoid valve and control relay.
- Purge control solenoid valve connector: Disconnected
- Control relay connector: Disconnected

NOTE
Touch the ohmmeter probes to both ends of the harness.

Repair the harness.

Check for an open-circuit, or a short-circuit to earth, between the purge control solenoid valve and the engine control unit.
- Purge control solenoid valve connector: Disconnected
- Engine control unit connector: Disconnected

Repair the harness.
EGR CONTROL SOLENOID VALVE

HARNESS INSPECTION

1. Check for continuity between EGR control solenoid valve and control relay:
   - EGR control solenoid valve connector: Disconnected
   - Control relay connector: Disconnected

   NOTE: Touch the ohmmeter probes to both ends of the harness.

2. Check for an open-circuit, or a short-circuit to earth, between the EGR control solenoid valve and the engine control unit:
   - EGR control solenoid valve connector: Disconnected
   - Engine control unit connector: Disconnected

STOP

OK → Repair the harness.

OK → Repair the harness.

OK → Repair the harness.
FUEL PRESSURE CONTROL VALVE

Check for continuity between fuel pressure control solenoid valve and control relay:
- Fuel pressure control solenoid valve connector: Disconnected
- Control relay connector: Disconnected

NOTE:
- Touch the ohmmeter probes to both ends of the harness.
- Repair the harness.

HARNESS INSPECTION

Check for an open-circuit, or a short-circuit to earth, between the fuel pressure control solenoid valve and the engine control unit:
- Fuel pressure control solenoid valve connector: Disconnected
- Engine control unit connector: Disconnected

STOP
- Repair the harness.
WASTE GATE CONTROL SOLENOID VALVE

HARNESS INSPECTION

1. Check for continuity between waste gate control solenoid valve and control relay.
   - Waste gate control solenoid valve connector: Disconnected
   - Control relay connector: Disconnected

   NOTE
   Touch the ohmmeter probes to both ends of the harness.

2. Check for an open-circuit, or a short-circuit to earth, between the waste gate control solenoid valve and the engine control unit.
   - Waste gate control solenoid valve connector: Disconnected
   - Engine control unit connector: Disconnected

   Repair the harness.
   (A 2 - 43)
**BOOST METER**

- Equipment side connector

- Engine control unit

- Boost meter

**HARNESS INSPECTION**

1. Harness side connector

   - Measure the power supply voltage.
   - Connector: Disconnected
   - Ignition switch: ON

<table>
<thead>
<tr>
<th>Voltage (V)</th>
<th>OK</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>SV</td>
<td>OK</td>
<td></td>
</tr>
</tbody>
</table>

   - Repair the harness.

2. Engine control unit harness side connector

   - Check for an open-circuit or a short-circuit to earth between the engine control unit and the boost meter.
   - Boost meter connector: Disconnected
   - Engine control unit connector: Disconnected

<table>
<thead>
<tr>
<th></th>
<th>OK</th>
<th>STAPE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OK</td>
<td></td>
</tr>
</tbody>
</table>

   - Repair the harness.
ANTI-LOCK BRAKING SIGNAL

TERMINAL VOLTAGE CHECK CHART

Engine Control Unit Connector Terminal Configuration

<table>
<thead>
<tr>
<th>Terminal No.</th>
<th>Check point</th>
<th>Check conditions (Engine conditions)</th>
<th>Standard value</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>80</td>
<td>Back-up power supply</td>
<td>Ignition switch: OFF</td>
<td>SV</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Power supply</td>
<td>Ignition switch: ON</td>
<td>SV</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>82</td>
<td>Ignition switch IG</td>
<td>Ignition switch: ON</td>
<td>SV</td>
<td></td>
</tr>
<tr>
<td>38</td>
<td>Control relay (power supply)</td>
<td>Ignition switch: OFF</td>
<td>SV</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>Control relay (fuel pump)</td>
<td>Ignition switch: ON, Engine: Running at idle</td>
<td>0 - 3V</td>
<td></td>
</tr>
<tr>
<td>81</td>
<td>Sensor impressed voltage</td>
<td>Ignition switch: ON</td>
<td>4.5 - 5.5V</td>
<td></td>
</tr>
<tr>
<td>Terminal No.</td>
<td>Check point</td>
<td>Check conditions (Engine conditions)</td>
<td>Standard value</td>
<td>Remarks</td>
</tr>
<tr>
<td>-------------</td>
<td>------------------------------</td>
<td>------------------------------------------</td>
<td>----------------</td>
<td>---------</td>
</tr>
<tr>
<td>90</td>
<td>Air flow sensor</td>
<td>Engine: Running at idle</td>
<td>2.2–3.2V</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Engine speed: 2,000 r/min</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>Air flow sensor reset signal</td>
<td>Engine: Running at idle</td>
<td>0–1V</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Engine speed: 3,000 r/min</td>
<td>6–9V</td>
<td></td>
</tr>
<tr>
<td>72</td>
<td>Intake air temperature sensor</td>
<td>Ignition switch: ON</td>
<td>When intake temperature is 0°C (32°F)</td>
<td>3.2–3.8V</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>When intake temperature is 20°C (68°F)</td>
<td>2.3–2.9V</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>When intake temperature is 40°C (104°F)</td>
<td>1.5–2.1V</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>When intake temperature is 80°C (176°F)</td>
<td>0.4–1.0V</td>
</tr>
<tr>
<td>85</td>
<td>Barometric pressure sensor</td>
<td>Ignition switch: ON</td>
<td>When altitude is 0 m (0 ft.)</td>
<td>3.7–4.3V</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>When altitude is 1,200 m (3,937 ft.)</td>
<td>3.2–3.8V</td>
</tr>
<tr>
<td>83</td>
<td>Water temperature sensor</td>
<td>Ignition switch: ON</td>
<td>When water temperature is 0°C (32°F)</td>
<td>3.2–3.8V</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>When water temperature is 20°C (68°F)</td>
<td>2.3–2.9V</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>When water temperature is 40°C (104°F)</td>
<td>1.3–1.9V</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>When water temperature is 80°C (176°F)</td>
<td>0.3–0.9V</td>
</tr>
<tr>
<td>84</td>
<td>Throttle position sensor</td>
<td>Ignition switch: Kept in ON state for more than 15 seconds</td>
<td>Throttle valve placed in idle position</td>
<td>0.3–1.0V</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Throttle valve placed in fully opened position</td>
<td>4.5–5.5V</td>
</tr>
<tr>
<td>87</td>
<td>Idle position switch</td>
<td>Ignition switch: ON</td>
<td>Throttle valve placed in idle position</td>
<td>0–1V</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Throttle valve placed in slightly opened position</td>
<td>4V or more</td>
</tr>
<tr>
<td>88</td>
<td>Cam position sensor</td>
<td>Engine: Cranked</td>
<td>0.2–3.0V</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Engine: Running at idle</td>
<td></td>
<td></td>
</tr>
<tr>
<td>89</td>
<td>Crank angle sensor</td>
<td>Engine: Cranked</td>
<td>0.2–3.0V</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Engine: Running at idle</td>
<td></td>
<td></td>
</tr>
<tr>
<td>71</td>
<td>Ignition switch–ST</td>
<td>Engine: Cranked</td>
<td>8V or more</td>
<td></td>
</tr>
<tr>
<td>86</td>
<td>Vehicle speed sensor</td>
<td>• Ignition switch: ON</td>
<td>0 ↔ 5V</td>
<td>(Changes repeated)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Move the vehicle slowly forward</td>
<td></td>
<td></td>
</tr>
<tr>
<td>37</td>
<td>Power steering fluid pressure switch</td>
<td>Engine: Running at idle after warmup</td>
<td>Steering wheel placed in neutral (straight ahead) position</td>
<td>5V</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Steering wheel turned half a turn</td>
<td>0–3V</td>
</tr>
<tr>
<td>Terminal No.</td>
<td>Check point</td>
<td>Check conditions (Engine conditions)</td>
<td>Standard value</td>
<td>Remarks</td>
</tr>
<tr>
<td>------------</td>
<td>-------------</td>
<td>-------------------------------------</td>
<td>----------------</td>
<td>---------</td>
</tr>
<tr>
<td>45</td>
<td>Air conditioner switch 1</td>
<td>Engine: Running at idle</td>
<td>Air conditioner switch set to OFF</td>
<td>0–3V</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Air conditioner switch set to ON (Air conditioner compressor in driven state)</td>
<td>SV</td>
</tr>
<tr>
<td>57</td>
<td>Air conditioner switch 2</td>
<td>Engine: Running at idle</td>
<td>Air conditioner switch set to OFF</td>
<td>0–3V</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Air conditioner switch set to ON</td>
<td>• Indoor set temperature brought closer to atmospheric temperature</td>
<td>SV</td>
</tr>
<tr>
<td>8</td>
<td>Air conditioner relay</td>
<td>• Engine: Running at idle</td>
<td>SV or 6V or more for a moment → 0–3V</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Air conditioner switch: OFF → ON (Air compressor in driven state)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>Fan motor relay (Lo)</td>
<td>Radiator fan not operating</td>
<td>B+</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Coolant temperature: below 90°C [194°F])</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>Fan motor relay (Hi)</td>
<td>Radiator fan operating at high speeds</td>
<td>B+</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Coolant temperature: above 105°C [20°C])</td>
<td></td>
<td></td>
</tr>
<tr>
<td>55</td>
<td>Electric load switch</td>
<td>Engine: Running at idle</td>
<td>Lighting switch set to OFF</td>
<td>0–3V</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lighting switch set to ON</td>
<td>SV</td>
<td></td>
</tr>
<tr>
<td>76</td>
<td>Oxygen sensor</td>
<td>Engine: Kept running at 2,000 r/min after warmup (Digital voltmeter to be used for checking)</td>
<td>0 ↔ 0.8V (Changes repeated)</td>
<td>Terminal 55 for rear bank</td>
</tr>
<tr>
<td>75</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>No. 1 injector</td>
<td>Engine: Running at idle after warmup, and accelerated abruptly by depressing accelerator pedal</td>
<td>Falls temporarily a little from 11–14V.</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>No. 2 injector</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>No. 3 injector</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>No. 4 injector</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>No. 5 injector</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>No. 6 injector</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Stepper motor coil &lt;A1&gt;</td>
<td>Engine: Just after the warmed-up engine has started (for 1 minute)</td>
<td>SV</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Stepper motor coil &lt;A2&gt;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Stepper motor coil &lt;B1&gt;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Stepper motor coil &lt;B2&gt;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Terminal No.</td>
<td>Check point</td>
<td>Check conditions (Engine conditions)</td>
<td>Standard value</td>
<td>Remarks</td>
</tr>
<tr>
<td>-------------</td>
<td>------------------------------</td>
<td>-----------------------------------------------------------------------------------------------------</td>
<td>----------------</td>
<td>---------</td>
</tr>
<tr>
<td>10</td>
<td>Power transistor unit A</td>
<td>Engine speed: 3,000 r/min</td>
<td>0.3 - 3V</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>Power transistor unit B</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Power transistor unit C</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>Purge control solenoid valve</td>
<td>Ignition switch: ON</td>
<td>SV</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Start the warmed-up engine and keep the engine speed at 3,000 r/min</td>
<td>0 - 3V</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Fuel pressure control valve</td>
<td>Ignition switch: ON</td>
<td>SV</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Engine: From cranking to idling (within approx. 2 minutes)</td>
<td>0 - 3V</td>
<td></td>
</tr>
<tr>
<td>43</td>
<td>Waste gate solenoid valve</td>
<td>Ignition switch: ON</td>
<td>SV</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Engine: Idling (when the premium gasoline is used)</td>
<td>0 - 3V</td>
<td></td>
</tr>
<tr>
<td>32</td>
<td>Turbo meter</td>
<td>Ignition switch: ON</td>
<td>4 - 13V</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Engine: Depress the accelerator pedal abruptly while the engine is idling</td>
<td>Falls temporarily from SV</td>
<td></td>
</tr>
<tr>
<td>35</td>
<td>Fuel pump relay 2</td>
<td>Engine: Depress the accelerator pedal abruptly while the engine is idling</td>
<td>Rises temporarily from 0 - 3V</td>
<td></td>
</tr>
<tr>
<td>58</td>
<td>Engine ignition signal</td>
<td>Engine: 3,000 rpm</td>
<td>0.3 - 3V</td>
<td></td>
</tr>
<tr>
<td>52</td>
<td>Ignition timing adjustment terminal</td>
<td>Ignition switch: ON</td>
<td>0 - 1V</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Engine: Depress the accelerator pedal abruptly while the engine is idling</td>
<td>Rises temporarily from 4.0-5.5V</td>
<td></td>
</tr>
<tr>
<td>36</td>
<td>Engine warning lamp</td>
<td>Ignition switch: OFF → ON</td>
<td>0 - 3V</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>EGR control solenoid valve</td>
<td>Engine: Running at idle and accelerated abruptly by depressing accelerator pedal</td>
<td>SV</td>
<td>Falls temporarily from SV</td>
</tr>
<tr>
<td>44</td>
<td>Anti-lock braking signal</td>
<td>Engine: Running at idle</td>
<td>SV</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- When vehicle is started in motion for the first time after the ignition switch was placed in ON position</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Vehicle speed: 0 → 10 km/h (0 → 0.6 mph)</td>
<td>0 - 3V</td>
<td></td>
</tr>
</tbody>
</table>
GROUP 54

CHASSIS ELECTRICAL

GENERAL

OUTLINE OF CHANGE

The following service procedures have been changed and the system has been changed from an option to standard equipment to correspond to changes in the immobilizer-ECU.
- Troubleshooting
- ID code registration method

IGNITION SWITCH AND IMMOBILIZER SYSTEM

TROUBLESHOOTING

INSPECTION CHART FOR DIAGNOSIS TROUBLE CODES

<table>
<thead>
<tr>
<th>Diagnosis code No.</th>
<th>Inspection items</th>
<th>Reference page</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>Transponder communication system</td>
<td>54-1</td>
</tr>
<tr>
<td>12</td>
<td>ID codes are not the same or are not registered</td>
<td>54-2</td>
</tr>
</tbody>
</table>

INSPECTION PROCEDURE FOR DIAGNOSIS TROUBLE CODES

**Code No. 11 Transponder communication system**

The ID code of the transponder is not sent to the immobilizer-ECU immediately after the ignition switch is turned to the ON position.

<table>
<thead>
<tr>
<th>Probable cause</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Malfunction of transponder</td>
</tr>
<tr>
<td>- Malfunction of ignition key ring antenna</td>
</tr>
<tr>
<td>- Malfunction of harness or connector</td>
</tr>
<tr>
<td>- Malfunction of immobilizer-ECU</td>
</tr>
</tbody>
</table>

Does the engine start using the spare ignition key which has had the ID code registered?

<table>
<thead>
<tr>
<th>Code No. 12 generated</th>
<th>OK</th>
<th>Replace the ignition key that does not work.</th>
<th>Re-register the ID code. (Refer to P.54-5.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diagnosis codes check</td>
<td>NG</td>
<td>To inspection procedure for diagnosis code No. 12 (Refer to P.54-2.)</td>
<td></td>
</tr>
<tr>
<td>Code No. 11 generated</td>
<td>OK</td>
<td>Replace</td>
<td></td>
</tr>
<tr>
<td>Ignition key ring antenna continuity</td>
<td>NG</td>
<td>Repair</td>
<td></td>
</tr>
<tr>
<td>Check the following connectors. C-89, C-90</td>
<td>OK</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Check trouble symptoms.</td>
<td>NG</td>
<td>Check the harness between the immobilizer-ECU and the ignition key ring antenna.</td>
<td>OK</td>
</tr>
</tbody>
</table>
Code No. 12 ID codes are not the same or are not registered
The ID code which is sent from the transponder is not the same as the ID code which is registered in the immobilizer-ECU.

Probable cause
- The ID code in the ignition key being used has not been properly registered.
- Malfunction of immobilizer-ECU

Re-register the ID code. (Refer to P.54-5.)
Check trouble symptoms. NG Replace the immobilizer-ECU.

INSPECTION CHART FOR TROUBLE SYMPTOMS

<table>
<thead>
<tr>
<th>Trouble symptom</th>
<th>Inspection procedure No.</th>
<th>Reference page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication with the MUT-II is not possible</td>
<td>1</td>
<td>54-2</td>
</tr>
<tr>
<td>Diagnosis code No. 54 has been generated by the engine-ECU</td>
<td>2</td>
<td>54-3</td>
</tr>
<tr>
<td>ID code cannot be registered using the MUT-II</td>
<td>3</td>
<td>54-3</td>
</tr>
<tr>
<td>Engine does not start (turns over but does not ignite)</td>
<td>4</td>
<td>54-4</td>
</tr>
<tr>
<td>Immobilizer-ECU power circuit and earth circuit check</td>
<td>5</td>
<td>54-4</td>
</tr>
</tbody>
</table>

INSPECTION PROCEDURE FOR TROUBLE SYMPTOMS

Inspection Procedure 1

Communication with the MUT-II is not possible.
The cause is probably a malfunction of the diagnosis line or the immobilizer-ECU is not functioning.

Can the MUT-II communicate with the engine-ECU?

NO
Check the following connectors. C-70, C-90 NG Repair

OK
Check trouble symptoms.

NG
Check the engine-ECU power supply and earth circuit, and repair if necessary.

Disconnect the engine-ECU connector C-99 and immobilizer-ECU connector C-90 and measure at the harness side Continuity between the C-99 terminal No. 91 and C-90 terminal No. 5

OK: Continuity

NG
Check the following connectors. C-90, C-99 NG Repair

OK
Check trouble symptoms.

NG
Check the harness wire between the engine-ECU and immobilizer-ECU, and repair if necessary.

Check trouble symptoms.

OK
Check the harness between the immobilizer-ECU power circuit and the earth circuit. (Refer to inspection procedure 5.)

NG
Replace the immobilizer-ECU.
### Inspection Procedure 2

**Diagnosis code No. 54 has been generated by the engine-ECU.**

<table>
<thead>
<tr>
<th>Probable cause</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Malfunction of harness or connector</td>
</tr>
<tr>
<td>• Malfunction of immobilizer-ECU</td>
</tr>
<tr>
<td>• Malfunction of engine-ECU</td>
</tr>
</tbody>
</table>

There is a problem with communication between the engine-ECU and the immobilizer-ECU.

- **Check the following connectors.**
  - C-21 (LHD), C-60 (RHD), C-90, C-99

  - OK

  - NG → Repair

- **Check trouble symptoms.**

  - NG → Check the harness wire between the engine-ECU and immobilizer-ECU, and repair if necessary

- **Disconnect the engine-ECU connector C-99 and immobilizer-ECU connector C-90 and measure at the harness side.**

  - Continuity between the C-99 terminal No. 91 and C-90 terminal No. 5

    - OK: Continuity

    - YES

    - NO

  - NG → Replace the engine-ECU.

- Is diagnosis code No. 21 being generated by the immobilizer-ECU?

  - YES

  - NO

  - OK → Check trouble symptoms.

  - NG → Replace the immobilizer-ECU.

- **Check the harness between the immobilizer-ECU power circuit and the earth circuit.**

   (Refer to inspection procedure 5.)

### Inspection Procedure 3

**ID code cannot be registered using the MUT-II.**

<table>
<thead>
<tr>
<th>Probable cause</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Malfunction of transponder</td>
</tr>
<tr>
<td>• Malfunction of ignition key ring antenna</td>
</tr>
<tr>
<td>• Malfunction of harness or connector</td>
</tr>
<tr>
<td>• Malfunction of immobilizer-ECU</td>
</tr>
</tbody>
</table>

The cause is probably that the immobilizer-ECU cannot read the ID code, or there is a malfunction of the immobilizer-ECU.

- No ignition keys can be registered.

  - YES

  - NO → Replace the ignition key that cannot be registered.

- Is a normal diagnosis code output?

  - YES

  - NO → To diagnosis code classification table (Refer to P.54-1.)

  - NG → Re-register the ID code. (Refer to P.54-5.)

- Check the harness between the immobilizer-ECU power circuit and the earth circuit.

  (Refer to inspection procedure 5.)

  - OK → Check trouble symptoms.

  - NG → Replace the immobilizer-ECU.
### Inspection Procedure 4

**Engine does not start (turns over but does not ignite)**

<table>
<thead>
<tr>
<th>Probable cause</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malfunction of MPI system</td>
</tr>
<tr>
<td>Malfunction of immobilizer system</td>
</tr>
</tbody>
</table>

If the fuel injectors are not operating, there might be a problem with the MPI system in addition to a malfunction of the immobilizer system.

It is normal for this to occur if an attempt is made to start the engine using a key that has not been properly registered.

| Check the system voltage during cranking. OK: 8V or more NG: Battery check |
|---|---|
| Is a normal diagnosis code output from the immobilizer-ECU? YES: Proceed to diagnosis code classification table (Refer to P. 54-2.) NO: Refer to GROUP 13 - Troubleshooting. |
| To inspection procedure for when there is no ignition (Refer to GROUP 13 - Troubleshooting.) |
| Check trouble symptoms. |
| Check the harness between the immobilizer-ECU power circuit and the earth circuit. (Refer to inspection procedure 5.) |

### Inspection Procedure 5

**Immobilizer-ECU power circuit and earth circuit check**

<table>
<thead>
<tr>
<th>Measure at immobilizer-ECU connector C-90.</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Disconnect the connector and measure at the harness side.</td>
</tr>
<tr>
<td>- Ignition switch: ON</td>
</tr>
<tr>
<td>(1) Voltage between terminal No. 7 and body earth OK: System voltage NG: Check trouble symptoms.</td>
</tr>
<tr>
<td>(2) Continuity between terminal No. 3 and body earth OK: Check the harness between the immobilizer-ECU and the engine control relay, and repair if necessary.</td>
</tr>
<tr>
<td>(1) NG NG: Repair</td>
</tr>
<tr>
<td>(2) NG</td>
</tr>
<tr>
<td>Check the harness between the immobilizer-ECU and the body earth, and repair if necessary.</td>
</tr>
</tbody>
</table>
CHECK AT IMMOBILIZER-ECU
TERMINAL VOLTAGE CHECK CHART

<table>
<thead>
<tr>
<th>Terminal No.</th>
<th>Signal</th>
<th>Check requirements</th>
<th>Terminal voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Immobilizer-ECU earth</td>
<td>-</td>
<td>0V</td>
</tr>
<tr>
<td>7</td>
<td>Immobilizer-ECU power supply</td>
<td>Ignition switch: ON</td>
<td>System voltage</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ignition switch: Within 5 seconds after changing from ON to OFF</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ignition switch: OFF, or 5 seconds after changing from ON to OFF</td>
<td>0V</td>
</tr>
</tbody>
</table>

IGNITION SWITCH

ID CODE REGISTRATION METHOD

If using an ignition key that has just been newly purchased, or if the immobilizer-ECU has been replaced, you will need to register the ID codes for each ignition key being used into the immobilizer-ECU. (A maximum of eight different ID codes can be registered.)

Moreover, when the immobilizer-ECU has been replaced, you will need to use the MUT-II to register the password that the user specifies into the immobilizer-ECU. (Refer to the "MUT-II REFERENCE MANUAL" or "MUT-II OPERATING INSTRUCTIONS" on using the MUT-II.)

Caution

Because registering of the ID codes is carried out after all previously-registered codes have been erased, you should have ready all of the ignition keys that have already been registered.

1. Connect the MUT-II to the diagnosis connector.

Caution

Turn off the ignition switch before connecting or disconnection of the MUT-II.

2. Check that the diagnosis code No. 54 is not being generated by the engine-ECU. If it is being generated check according to the Troubleshooting Procedures. (Refer to GROUP 13A – Troubleshooting.)

3. Use the ignition key that is to be registered to turn on the ignition switch.
4. Use the MUT-II to register the ID code. If you are registering two or more keys, pull out the first key and then insert the next key to be registered and turn the ignition switch to ON within 5 seconds, and without disconnecting the MUT-II.

NOTE
If more than 5 seconds pass, the engine control relay which supplies power to the immobilizer-ECU will turn off, and further registration will not be possible.

5. Turn off the ignition switch.
6. Check that the engine can be started with each of the ignition keys.
7. Check the diagnosis output from the engine-ECU, and erase code No. 54 if it appears. (Refer to GROUP 13A – Troubleshooting.)
8. Disconnect the MUT-II. This completes the registration operation.